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Two Sides to Newfoundland Biotech

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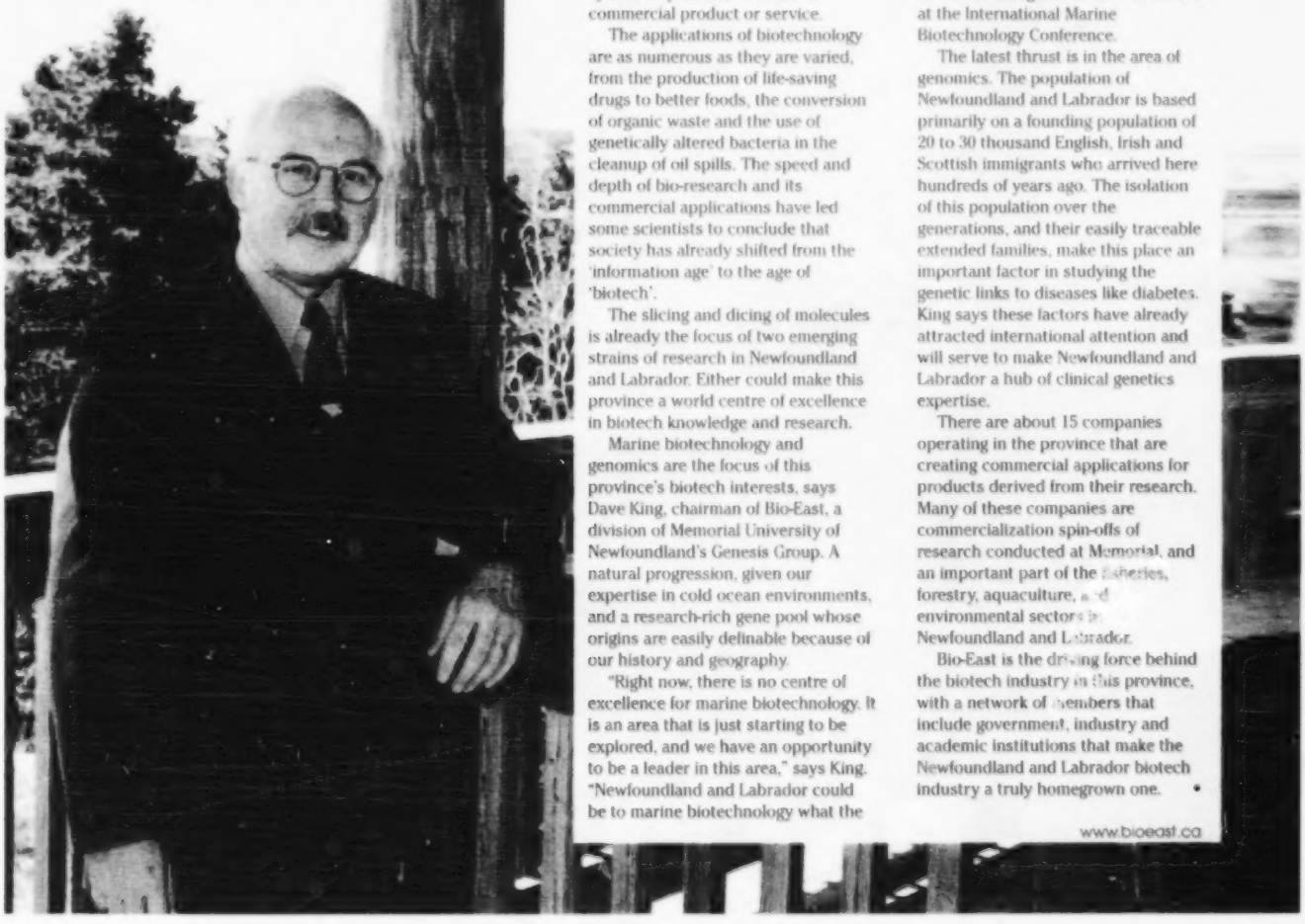
- Dave King, chairman of Bio-East



Biotechnology has been practiced by human society since the first baker combined ingredients to produce bread – or botched the process completely and created beer.

A specific definition would be the application of a living organism, system or process, to create a commercial product or service.

The applications of biotechnology are as numerous as they are varied, from the production of life-saving drugs to better foods, the conversion of organic waste and the use of genetically altered bacteria in the cleanup of oil spills. The speed and depth of bio-research and its commercial applications have led some scientists to conclude that society has already shifted from the 'information age' to the age of 'biotech'.

The slicing and dicing of molecules is already the focus of two emerging strains of research in Newfoundland and Labrador. Either could make this province a world centre of excellence in biotech knowledge and research.

Marine biotechnology and genomics are the focus of this province's biotech interests, says Dave King, chairman of Bio-East, a division of Memorial University of Newfoundland's Genesis Group. A natural progression, given our expertise in cold ocean environments, and a research-rich gene pool whose origins are easily definable because of our history and geography.

"Right now, there is no centre of excellence for marine biotechnology. It is an area that is just starting to be explored, and we have an opportunity to be a leader in this area," says King. "Newfoundland and Labrador could be to marine biotechnology what the Silicon Valley was to the advent of the information technology industry."

The industry already employs about 400 people in the province with biotech research and development expected to advance over the next few years. In 2005, the province will host about 500 delegates from 35 countries at the International Marine Biotechnology Conference.

The latest thrust is in the area of genomics. The population of Newfoundland and Labrador is based primarily on a founding population of 20 to 30 thousand English, Irish and Scottish immigrants who arrived here hundreds of years ago. The isolation of this population over the generations, and their easily traceable extended families, make this place an important factor in studying the genetic links to diseases like diabetes. King says these factors have already attracted international attention and will serve to make Newfoundland and Labrador a hub of clinical genetics expertise.

There are about 15 companies operating in the province that are creating commercial applications for products derived from their research. Many of these companies are commercialization spin-offs of research conducted at Memorial, and an important part of the fisheries, forestry, aquaculture, and environmental sectors in Newfoundland and Labrador.

Bio-East is the driving force behind the biotech industry in this province, with a network of members that include government, industry and academic institutions that make the Newfoundland and Labrador biotech industry a truly homegrown one. •

www.bioeast.ca

Biotechnology sketches

A/F Protein Canada is developing the commercial potential of antifreeze proteins, a unique group of proteins produced by cold ocean fish to help them survive at sub-zero temperatures. The company is based on a discovery by Dr. Garth Fletcher and Dr. Choy Hew at Memorial University,s Ocean Sciences Centre over 25 years ago. A/F Protein purifies the proteins from their natural source for sale to the research and development community, and is currently collaborating on projects focusing on using the proteins for the purposes of product exploration and development; food preservation enhanced cryosurgical techniques; and cosmetic applications.

A spin-off of A/F Protein Canada is **AQUA Bounty Canada**, a company that combines selective breeding and biotechnology research to produce genetically modified salmon that can grow faster than salmon living in the wild. In providing broodstock for aquaculture operations, AQUA Bounty Canada aims to revolutionize the aquaculture industry by creating faster growing fish. These fish will reach market size more rapidly than standard salmon, making the overall industry more efficient and competitive.

Applied Preservation Technologies (APT Inc.) uses the waste from one traditional Newfoundland and Labrador fishing industry as the basis for a new hi-tech research project. APT uses waste shells from secondary crab and shrimp processing to produce medical and nutraceutical products (nutritional aids available without a doctor's prescription). A secondary benefit is a cleaner shellfish processing industry for the province and a series of new high-value products.

As research provides more and more evidence linking our genes with various diseases, researchers are looking for ways of mapping genetic information faster. **Newfound Genomics** is one company looking at the genes of Newfoundlanders and Labradorians to further that research. Newfound Genomics has established a strategic partnership with Sequenom, a leading discovery genetics company. The San Diego-based company has intergrated a high performance technology platform and innovative strategies for determining the medical impact of genes and genetic variations. Together they plan to pool their resources and expertise to link up genetic research being conducted in this province with medical research projects around the world.

NewLab Clinical Research Inc. is a local company on a mission to cure a common disease that seems more common in Newfoundland and Labrador than in most other places. NewLab's Dr. Wayne Gulliver first noted the prevalence of psoriasis in this province upon his return to practice in Newfoundland in 1989. Compiling family histories and on a case-by-case basis numbering in the thousands, NewLab is studying the clues that may provide new treatments for skin diseases like excema, leg ulcers, and psoriasis. Dr. Gulliver believes the legions of patients who offer their time and assistance, in addition to facilitating his research, will help end the suffering of patients around the globe. The company has completed over 70 clinical trials and currently has 23 ongoing trials as part of this overall effort.

NovaLipids is designing a courier service for drugs. In technical terms, the company is working towards a liposomal system that carries drugs to targeted sites in the body that will help maintain an appropriate level of the drug in the blood stream. Liposomes are microscopic spheres made up of phospholipids, a natural component of cell membranes, and other biological compounds. Many existing drugs and vaccines can be inserted into liposomes to make them work more effectively. NovaLipids innovative work is developing a liposomal system for the animal health market, a "platform technology" that can be applied to several existing products and animal species.

Quality Bait Services of Harbour Grace have discovered that fish can be finicky eaters, so finding fish bait with 'universal appeal' can be a real innovation for the fishery and aquaculture industries. The company hopes that the millions of pounds of fish waste that are discarded each year can become a valuable recycled resource with more than commercial value. Quality Bait Services is testing various formulations, embarking on sea trials and looking to expand the applications for its bait products. The company produces a unique 'bait bag' that will result in the use of fewer small fish, leaving them in the ocean to mature. Their baits also allow for easier storage and have a longer shelf life than traditional whole fish baits. The company's research may also result in better organic compost products, nutraceutical and pharmaceutical products all produced from a previously untapped source. •

www.aquabounty.com • www.biomarinex.nf.net • www.newfound-genomics.com • www.newlab-cro.com • www.novalipids.com • www.mun.ca/seabright/tnb

Johnson GEO Centre...
Opening up the planet for a look-see

We've heard it before, 'Newfoundland and Labrador is unique'. Usually those words are spoken in any number of conversations regarding our history, our culture, our music, and now - our geological interpretation centre.

What geologists have known for a long time is now the focus of a truly world-class facility in St. John's that puts a new twist on what it means to talk about "The Rock". It's called the Johnson Geo Centre, the vision of one of Newfoundland and Labrador's more prominent philanthropists, Paul Johnson of the Johnson Family Foundation.

No other easily-reached place on the planet has a geological record that so fully reveals the geological history of the 4.5 billion-year-old Earth than Newfoundland and Labrador. In Labrador, the province's oldest rocks date back 3.87 billion years, and are amongst the oldest discovered anywhere on the planet. To the south, the rocks of Signal Hill are 550 million years old, over 400 million years older than the Rocky Mountains. You get to touch those rocks that make up Signal Hill – because they form the exposed rock walls of the Geo Centre.

"This Province is fortunate to possess one of the most complete and accessible portrayals of the Earth's geological history to be found anywhere on our planet. The GEO CENTRE was created to have Newfoundland and Labrador, 'The Geologist's Paradise,' become 'Earth's Geological Showcase.'" said Johnson about the new museum.

The building is as much a showcase because of its design as it is for the exciting and interactive displays that allow visitors to walk through re-creations of a glacial cave or natural rock formation, while learning about the forces that shaped the planet, climate changes, and the comparatively short time span of humankind.

The $11-million building was built in, not on, a natural rock basin that was originally a bog, covering glacial till and boulders. The basin was excavated and the centre constructed to fit between over 500 linear feet of exposed rock walls. The large, glass-encased entry, standing 2.5 stories high, is the only part of the building above ground. More than 85 per cent of the building's 33,600 square feet of floor space is underground. Even the building's heating and cooling system is an attraction. Six geothermal wells, each over 500 feet deep, were drilled to either extract heat from the deep rocks in winter or dissipate heat into them in the summer. •

www.geocentre.ca

Did You Know!

Goods and services exported from Newfoundland and Labrador are valued at about $8 billion per year compared with $4.3 billion five years ago.

Averaged forecasts of real GDP growth in Newfoundland and Labrador for 2002 is 4.9 per cent, according to 6 major private sector sources, including all of the major chartered Canadian banks and the Conference Board of Canada. This is the highest growth rate forecast for any Canadian province in 2002.

Provincial labour markets remained strong in the first seven months of this year, building on record high employment gains recorded in 2001. On a year-to-date basis, employment has grown by 2.1 per cent, creating 3,900 new jobs in the economy compared to the same seven month period in 2001.

The latest Public and Private Investment (PPI) intentions survey (released in late July) show planned expenditures of $3.327 billion for 2002, up 5.2 per cent from actual expenditures in 2001.

Biotechnology sketches continued

As computer programmers require a computer to do their jobs, the biotech industry requires clinical laboratories to do theirs. In Newfoundland and Labrador, **TNB Laboratories Inc.** is a company with fingers in the huge biotech pie.

With expertise in clinical immunology and microbiology, the company provides blood test kits for medical applications such as bone marrow transplantation matching and the prognosis of rheumatoid arthritis patients.

TNB Laboratories is now a privately owned company founded in 1988 by a group of scientists and researchers from Memorial University of Newfoundland, whose work in developing monoclonal antibodies is now but one of the many products and services they provide.

TNB Laboratories operates in St. John's from its ISO 9002 certified production laboratory where their research and development team perform custom work for a variety of commercial and academic clients.

Recently, as a result of their experience in transplantation immunology and DNA characterization, the company has focused on the development of diagnostic markers for cancers and infectious diseases as well as paternity testing, the only Atlantic Canada based laboratory providing such a service. •

Consilient cracks communications conundrum

75 per cent of knowledge workers will be mobile - on the road, at home, remote office, etc. at least 25 percent of the time by 2003/2004
(META Group)

Wireless communication is about to get a little easier thanks to a Newfoundland and Labrador company that's partnering with the makers of the award-winning Blackberry™ wireless handheld device.

Not all wireless technology solutions are created equal. A problem for Waterloo, Ontario-based Research in Motion's (RIM) wireless communications devices is that they can only run on two industry standard e-mail systems, Microsoft Exchange and Lotus Domino. Consilient Technologies Corporation's MX™ software is a solution that acts as a communication link between the Blackberry wireless handheld and any in-house e-mail system operated by any organization.

Consilient Technologies is a St. John's based company that offers business solutions for industries with mobile workers who require data access while on the road. The company's products are designed to provide a "holistic mobile business (m-business) model that eliminates the patchwork of technologies required to make today's mobile workers productive," said company president Trevor Adey.

Consilient's products enable wireless handheld devices to function similar to traditional wired desktop workstations. Mobile workers are able to connect to a organization's Information Technology system and access critical data and applications while away from the office – anytime, anywhere.

Originally due for release this fall, Consilient has had to preempt the official MX product launch by selling MX since early summer to meet demand across North America and Europe, Adey said.

In January of this year, Consilient has opened an office in Ottawa to pursue opportunities in the government and technology market in that region. •

www.consilient.net

Provincial Trade Missions and Exhibitions

EVENT	LOCATION	DATE	CONTACT	PHONE
October				
Fish Expo and Workboat Atlantic	Providence, RI	Oct 3-5	Paul Alexander	729-6623
New England Trade Mission	Boston, MA	Oct 21-25	Barry Snow Diane Hooper	729-3356
November				
Team Canada Atlantic	New York City, NY	Nov. 5-7	Jonathan Brockway	729-5680
IDRC/CoreNet	San Diego, CA	Nov. 16-20	Maria Yablon	729-4936
December				
International Workboat Show	New Orleans, LA	Dec. 4-6	Darrell O'Neill Terry Courish	729-0680
May 2003				
Offshore Technology Conference 2003	Houston, TX	May 5-8	Clyde Woodward	729-5064
CoreNet Global	Toronto, ON	May 3-7	Maria Yablon	729-4936
Team Canada Atlantic Trade Mission	Washington, DC	May	Jonathan Brockway	729-5680

Help spread the message!

Thank you for reading this edition of The Ambassador newsletter. We are always looking for ways to reach as many people as possible with the good news about business in Newfoundland and Labrador. If this copy of The Ambassador was mailed to you, pass it along, or request extra copies so you can help spread the news. If you're reading someone else's copy of the newsletter, contact us and we will put you on our mailing list. Our contact information is below.

Newfoundland & Labrador ✦ Canada
Department of Industry, Trade and Rural Development

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